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Patent Claims

Sub B1

1. Multilayer film optionally comprising a heat-sealable coating having an outer polyamide layer containing nanoscale particulate nucleating agents and at least one further polyamide layer, characterized in that, for the polyamide forming the outer layer, use is made of at least 90% polyamide 6, relative to the total mass of the polyamide in said layer, and the smallest constituents of the particles dispersed in the outer layer forming a rigid unit in the dispersion having as a number-weighted average of all the constituents a dimension of not more than 100 nm in at least one direction that can be arbitrarily chosen for each constituent, in that, when the outer layer is cooled from the completely molten state at a cooling rate of between 10° and 20°C per minute, crystalline structures are produced that originate from the surface of the particles dispersed therein, in that all the further polyamide layers contain the particles contained in the outer layer at a level of not more than one tenth of the proportion by weight of the particles in the outer layer, and in that the thickness of the outer layer is less than 50% of the total thickness of all the layers containing polyamide.

Sub A2

2. Multilayer film according to Claim 1, characterized in that the proportion by weight of the particles dispersed in the outer layer, relative to the total weight of the composition forming the outer layer, is between 0.1 and 3%..

3. Multilayer film according to Claim 1 or 2, characterized in that, in addition to polyamide 6, the outer layer contains a polyamide selected from the group comprising polyamide 6, polyamide 10, polyamide 12, polyamide 66, polyamide 610, polyamide 6I, polyamide 612, polyamide 6/66, polyamide 6I/6T, polyamide MXD6, polyamide 6/6I, polyamide 6/6T, polyamide 6/IPDI, copolymers of monomers forming said polymers or mixtures of said polymers or copolymers.

Sub A3

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4. Multilayer film according to one of Claims 1 to 3, characterized in that the particles dispersed in the outer layer comprise particles that have, in two mutually perpendicular directions that can be arbitrarily chosen for each particle, a dimension in each case of at least a tenth of the dimension of the particles in the direction with the smallest dimension.

Sub A4

5. Multilayer film according to one of Claims 1 to 4, characterized in that the particles dispersed in the outer layer are sheet silicates.

Sub A5

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6. Multilayer film according to one of Claims 1 to 5, characterized in that it contains one or more EVOH-containing layers.

Sub A6

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7. Multilayer film according to one of Claims 1 to 6, characterized in that it has an at least monolayer heat-sealable coating on that side of the multilayer film remote from the outer layer.

Sub A7

8. Multilayer film according to one of Claims 1 to 7, characterized in that it contains one or more coupling layers.

Sub A8

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9. Multilayer film according to one of Claims 1 to 8, characterized in that, in addition to the outer layer and one or more further layers composed of polyamide and, optionally, conventional additives and also, optionally, one or more EVOH-containing layers, one or more heat-sealable coatings and also one or more coupling layers, it additionally contains one or more further polymeric layers or a layer of a metal oxide or nonmetal oxide between two inner layers.

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Sub A9

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10. Multilayer film according to one of Claims 1 to 9, characterized in that at least one outer layer, optionally also a plurality of or all the layers are subjected after extrusion to a stretching operation only in the longitudinal direction, only in the transverse direction, first in the longitudinal direction

Sub A9

~~and then in the transverse direction, simultaneously in the longitudinal direction and transverse direction or combinations thereof.~~

Sub A10

11. ~~Multilayer film according to one of Claims 1 to 10, characterized in that it is produced as a blown film by coextrusion.~~

Sub A11

12. ~~Use of a multilayer film according to one of Claims 1 to 13 for packaging foodstuffs.~~

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